Facility Management Standard

for facilities, infrastructure, & environment

Standards Working Group Meeting

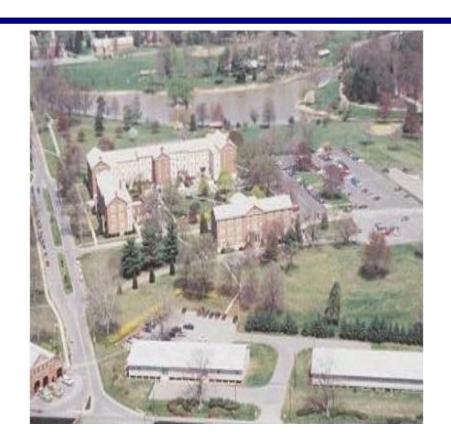
CADD/GIS Technology Center April 28, 2004

- Facility Management Standard for facilities, infrastructure, & environment
- Acronym FMSFIE
- CADD/GIS Technology Center Project No. 96.015



• Website - http://tsc.wes.army.mil/products/tssds-tsfms/fms/fmsprods.asp

- Develop Transactional Data Content Standard to support life cycle Facility Management (FM) functions at Military Installations and USACE Civil Works Projects.
 - Facilitate compliance with legal reporting requirements.
- Improve efficiency and lower costs associated with collection, management, analysis, and reporting of FM data.
- Called Facility Management Standard for facilities, infrastructure, & environment (FMSFIE).
- Provide Non-Proprietary Data Content Standard to Facilitate Sharing of FM Data.

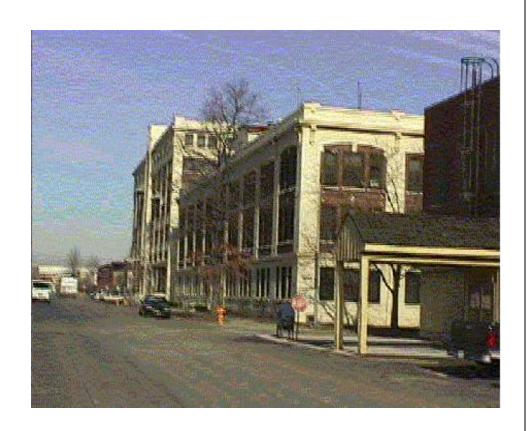


FMSFIE Website -

http://tsc.wes.army.mil/products/tssdstsfms/fms/fmsprods.asp

Transactional –

- Communicative actions or activities, involving multiple parties or things that reciprocally affect each other in a near real time setting that is based on life cycle events.
- Real Time, Temporal Data.



Coordination:

- FM Focus Group
- Patuxent River Naval Air Station (PAX)
- Army Integrated Facilities System (IFS)
- Air Force Interim Work Information Management System (IWIMS)
- Air Force Automated Civil Engineer System (ACES)
- Internet Navy Facility Assets Data Store (NFADS).
- USACE Facilities and Maintenance System (FEM)
- OSD Real Property Enterprise System (RPES)
- CADD/GIS Center SDSFIE &A/E/C CADD

Assessment of DoD Real Property
Information Systems

Coordinating Draft
June 5, 2001

Defense Information
 Systems Agency (DISA)

FMSFIE Development Components:

- Component 1 Prepare Technical Content/Guidance
- Component 2 Develop Software Tools
- Component 3 FMSFIE Meetings
- Component 4 Develop Transactional Data Models
- Component 5 Maintain Federal Real Property Management (RPM)

Web Site



FMSFIE Development

FMSFIE Data Content Standard - Development Steps

Step 1: Develop/Update Strategic Plan

Step 2: Develop Conceptual Data Model

Step 3: Develop/Update Naming Conventions & Data (Information) Model Hierarchy

Step 4: Identify Priority Areas, and Underlying Defined Focus Areas

- Example:
 - Priority Area Asset Management with emphasis on Building Management
 - Focus Area Asset Set, Facility Class,
 Building Sub-Class, Architectural Family



FMSFIE Data Content Standard - Development Steps

Step 5: Develop/Update Data Models for each Defined Focus Area

- Logical Models Developed 1st for each Focus Area
- Physical Models Define Detailed Table/Attribute Structure for importing into FMSFIE Library.

Step 6: Develop/Update FMSFIE Library

Maintained in Microsoft Access Database.

Step 7: Develop/Update Software Tools to Facilitate Use

- Browser
- Database Builder

Step 8: Develop/Update Written Guidance to Facilitate Use



FMSFIE Strategic Plan (FMSP) –

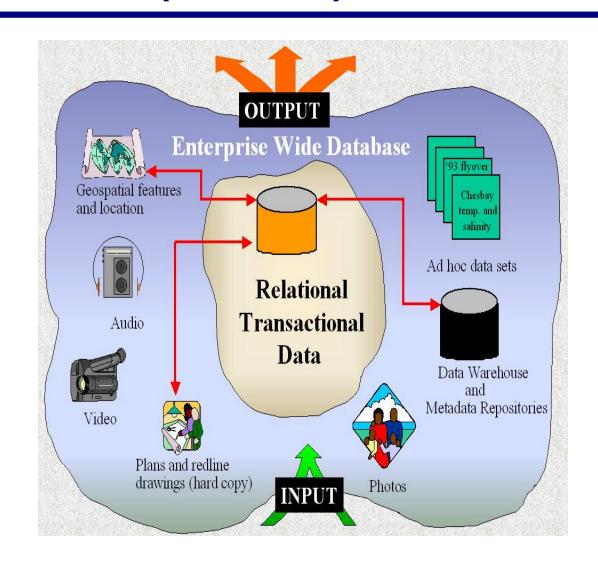
- Provides goals and objectives for development of FMSFIE.
- Provides plan for migrating FMSFIE to a transactional data model.
 - FMSFIE initially developed as subset of SDSFIE.
- Initial Plan Developed in 2000. Updated periodically, as required.



• Updated at October 2003 FMSFIE Working Meeting.

Transactional FMSFIE –

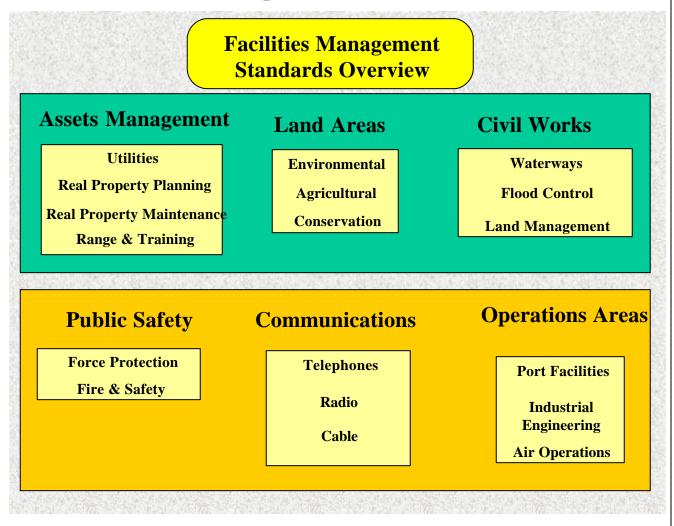
- Will be designed for management of life-cycle FM data.
- Will be designed to share data (be integrated) with both GIS (the SDSFIE) & CADD (A/E/C CADD Standards) technology.
- Will be designed for implementation on an enterprise (i.e., installation wide) relational database.



Facility Management Standard (FMSFIE) – Broad Focus Areas for "Transactional" Data Model Development

Broad Focus areas This is within the Facilities, Infrastructure and Environment Business Plan for the Center

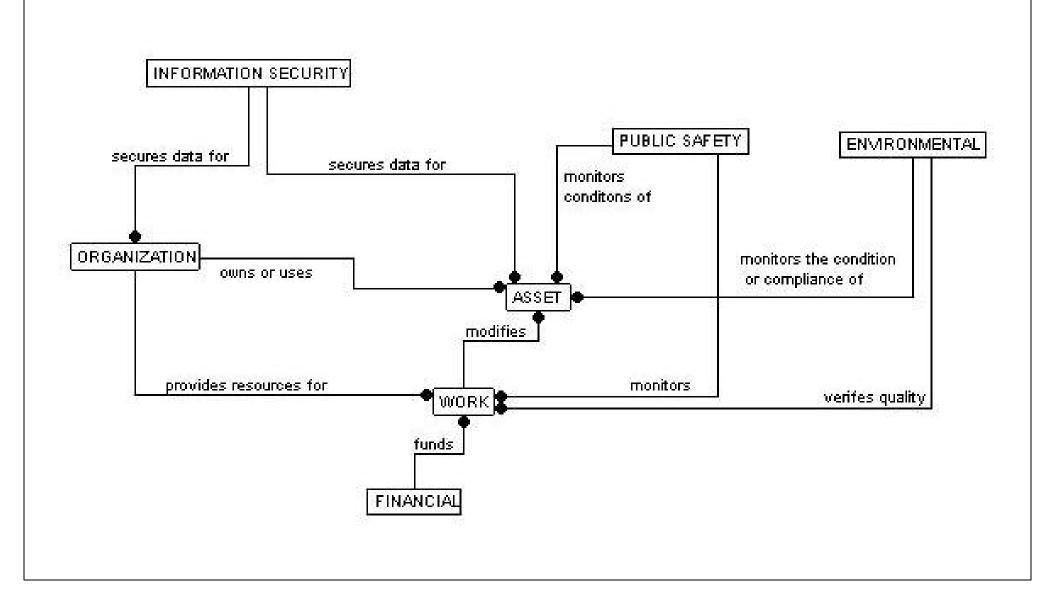
Work with the
Broad Associated areas
as the need to support the
Broad Focus area
development.



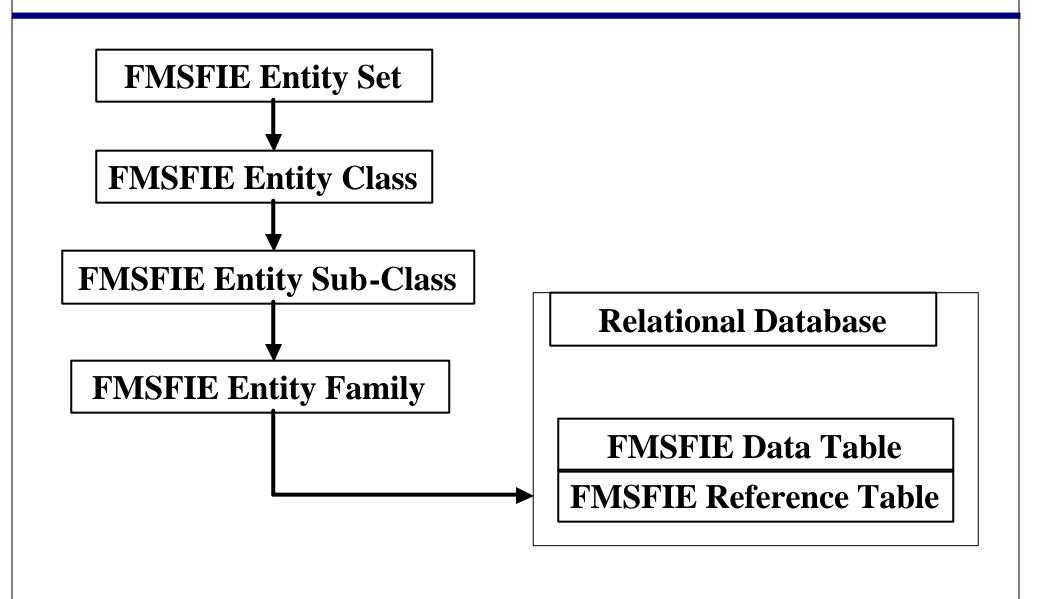
FMSFIE Design Considerations

- Compatible with Commercially Available Relational Database Management System (RDMS) Software.
- Compatible with SDSFIE & A/E/C CADD Standards.
- Compatible with Commercially Available CADD & GIS Software.
- Compatible with Microsoft Windows Operating Systems.
 - Windows 2000 & XL
- Define Data Model to Support Federal FM Legal Reporting Requirements.
- Support DISA and ISO Naming Conventions.
- Support Transactional Data Model & Schema.
- Provide User-Friendly Naming Conventions.
 - One Table Name & Attribute Field Name.
 - Table Names & Attribute Field Names are Meaningful to User.
 - Support Current & Future RDMS (i.e., DOS is not supported).

FMSFIE Conceptual Data Model



FMSFIE Data Model Hierarchy



FMSFIE Data Model Hierarchy Definitions

- Entity Set: Broad grouping of Real Property Management responsibilities.
- Entity Class: Sub-Grouping of an Entity Set providing grouping of similar real property classifications based upon legal reporting requirements.
- Entity Sub-Class: Sub-Grouping of an Entity Set based upon similar life-cycle event and temporal real property information.
- Entity Family: A functional sub-group of an Entity Sub-Class corresponding to different business disciplines, or different perspectives in the way data is structured below the Entity Sub-Class.

FMSFIE Relational Database - Table Definitions

- **Data Table**: Relational database table comprising a grouping of similar records.
 - Also called Attribute table.
 - Database table used by Users for data entry.
- **Reference Table:** Relational database table containing a listing of valid, permissible, or reference values.
 - Also called Domain and Lookup Values.
 - Incorporate SDSFIE Domain Values, where applicable.

Transactional FMSFIE -

- Will include seven Entity Sets:
 - Asset Management
 - Work Management
 - Environmental Management
 - Organization Management
 - Public Safety Management
 - Information Security Management
 - Financial Management
- Guidelines for development defined by FM Focus Group.
 - Compliant with DoD (DISA) & International Standards Organization (ISO) requirements.

FMSFIE Entity Set Definitions

Asset Management: Items comprising an inventory of federal real property and other related entities based on classification and need to support organizational requirements. Includes:

- (1) Tangible physical items comprising the inventory of federal real property that can be referenced by location;
- (2) Non-tangible items that cannot always be defined by a location, or do not exist as an inventory item in the real property management inventory.

Work Management: Change management that consists of planning, programming, acquisition, operations, maintenance, revitalization, evaluation, and disposal actions affecting real property (assets) and other related entities.

FMSFIE Entity Set Definitions

Financial Management: Planning, programming, and execution of appropriations associated with real property management.

Environmental Management: Defines the stewardship responsibilities as they relate to the environmental management practices.

Public Safety Management: Issues related to the protection of personnel and property.

Organization Management: A structured grouping of personnel and the roles they perform as it relates to an integrated work environment.

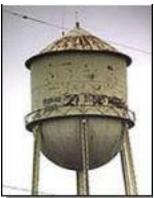
Information Security Management: Controlled access to data and information as it relates to the roles of personnel.

Initial FMSFIE Development Priorities

- 1st Priority Support basic Asset Management data requirements, with an emphasis on Building Management (Release 2.30).
- 2nd Priority Utility & Environmental Management.







FMSFIE Asset Management Entity Set - Classes

Asset Management - Set

Classes

Transportation

Non-Tangible

Core (Common)

Land (Real Property Class 1)

Facility
(Real Property Class 2)

Equipment (Real Property Classes 3 & 4)

FMSFIE Asset Management Entity Set – Facility Class – Sub-Classes

Facility – Class

Sub-Classes

Structure

Utility

Building

Base (Common)

FMSFIE Asset Management Entity Set – Facility Class – Building Sub-Class - Families

Building – Sub-Class

Families

Mechanical

Electrical

Plumbing

Interior Design

Structural

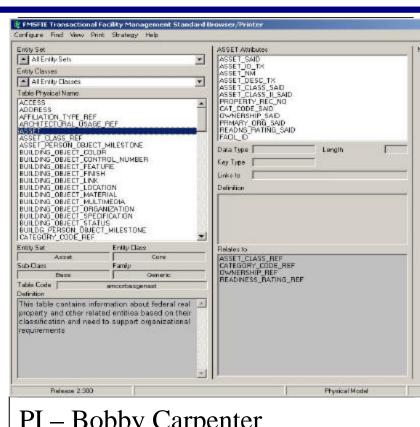
Architectural

Security

Telecommunications

Fire Protection

- Published first transactional FMSFIE release (FMSFIE Release 2.30) in Oct. 03.
- Revised and expanded FMSFIE Website.
- Federal Real Property Management (RPM) Database and Website expanded to include 1,173 Federal Laws and Policy Documents.
- RPM Website Law Traceability Matrix Expanded for all SDSFIE and FMSFIE Sets & Classes.
- Prepared "FMSFIE Naming Conventions & Structure Specification" white paper.
- Developed first release of FMSFIE Browser Software tool.

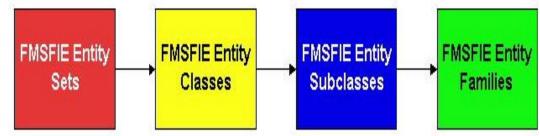


PI – Bobby Carpenter

FY03 Major **Accomplishments**

FMSFIE Release 2.30 (October 2003):

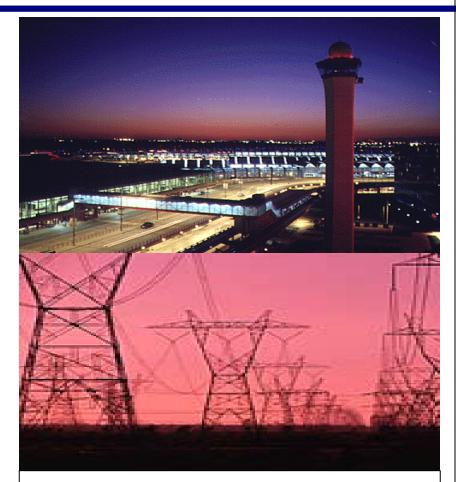
- Supports basic Federal Legal Reporting requirements for Asset Management.
- FMSFIE Browser provides viewing and printing capability of FMSFIE data dictionary.
- Data Model:
 - Entity Sets 7
 - Entity Classes 39
 - Entity Subclasses 124
 - Entity Families 32
 - Database Tables (Adopted) 103
 - Table Fields (Attributes) (Adopted) 470
 - Reference (Domain) Values 5,033
- Distributed via Internet download and CD-ROM.



FMSFIE Website - http://tsc.wes.army.mil/products/tssds-tsfms/fms/fmsprods.asp

Fiscal Year 2004 Priorities:

- 1. Publish 2 Updates of FMSFIE Data Library and Software Toolbox:
 - FMSFIE Release 2.31 March 2004
 - FMSFIE Release 2.40 October 2004
- 2. Expand Transactional Data Models:
 - Asset Management Buildings & Utilities
 - Environmental Management Compliance
 & Sampling
- 3. Expand RPM Website and Content.
- 4. Develop Initial FMSFIE Assets Implementation Guidance.
- 5. Begin Migration of FMSFIE Data Models from IDEF to UML format.
- 6. Investigate Technologies for Future Implementation Tool Development Web Based and/or Computer Desktop.



PI – Bobby Carpenter

FMSFIE Release 2.31 (March 2004):

- Includes Expanded Support for Asset Management.
- Includes Initial Support for Environmental Management
- FMSFIE Browser provides viewing and printing capability of FMSFIE data dictionary.
- Data Model:
 - Entity Sets 7
 - Entity Classes 38
 - Entity Subclasses 121
 - Entity Families 32
 - Database Tables (Adopted) 248
 - Table Fields (Attributes) (Adopted) 1,282
 - Reference (Domain) Values 5,033
- Distributed via Internet download and CD-ROM.

FMSFIE Website - http://tsc.wes.army.mil/products/tssds-tsfms/fms/fmsprods.asp

Component 1 (FY04) – Prepare Technical Content & Guidance:

C. FMSFIE Guidance -

- FM Strategic Plan –
- Naming Convention and Structure –
- Project Development Overview –
- Initial FMSFIE Implementation Guide -
 - Address how FMSFIE will integrate with SDSFIE & A/E/C CADD Standard
 - Demonstrate how to link FMSFIE data tables to CADD Drawings.
 - Discuss how to use FMSFIE for FM.





Component 1 (FY04) – Prepare Technical Content & Guidance:

D. FMSFIE Data Library –

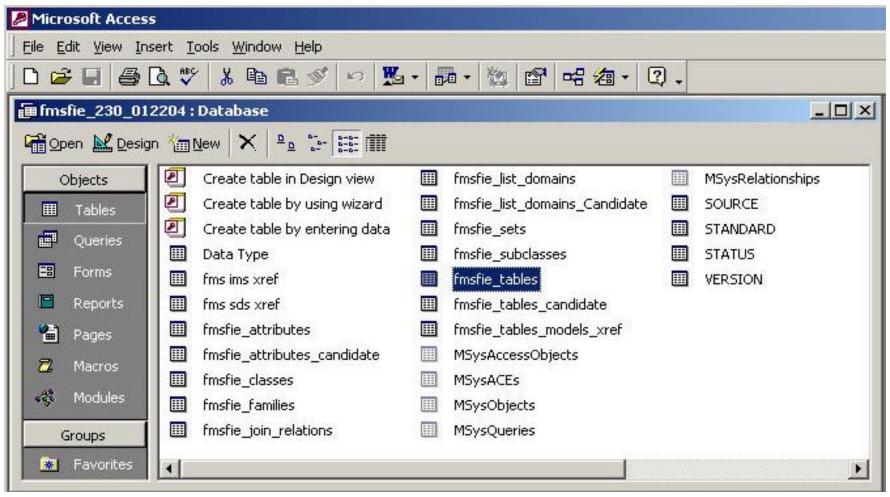
- Maintain Data Library -
 - Microsoft Access Database.
 - Contains Database Tables Comprising FMSFIE Library.
- Import Physical Data Models into Data Library -
- Research & Expand Content
 - Tables, Table Fields, Definitions, & Reference Values.
- Perform QA/QC Testing of Library -
- Two Updates Scheduled to be Published in FY04 -
 - Release 2.31 March 2004
 - Release 2.40 October 2004







FMSFIE Data Library



FMSFIE Data Content Standard – Library Update Process

- 1. New Data Elements added to FMSFIE Library are flagged as "Candidate".
 - Data Elements Tables, Attributes, & Domain Values.
 - Data Elements Incorporated in a Previous Release are Flagged as "Adopted".
 - Data Elements Changed from a Previous Release are Flagged as "Mo dified".
- 2. Listing of "Candidate" Data Elements is Distributed for Review Prior to Each Scheduled Release.
 - Exported from Library to Excel Spreadsheet.
- 3. "Candidate" Data Elements are Reviewed/Discussed at FM Focus Group Meeting.
- 4. FMSFIE Release is Completed.
 - Data Elements are Flagged as either "Adopted" or "Modified", as appropriate.
 - Data Elements in Logical Data Models still under development are maintained in separate tables.

Component 2 (FY04) – Develop Software Tools:

FMSFIE Transactional Facility Management Standard Browser/Printer
Configure Find View Print Strategy Help

A. FMSFIE Browser -

- Provides Software Tool for Viewing and Printing of FMSFIE Library -
- Updated Annually to
 - Maintain Compatibility with Microsoft Operating Systems
 - Incorporate Customer Comments
 - Improve Graphical User Interface (GUI)



- Visual Basic
- Tested for Operation with Windows 2000 and XP Operating Systems
- One Update of Desktop Browser Scheduled in FY04
 - Release 2.40 October 2004



FMSFIE Release 2.30 Browser

Entity Set		ASSET_CLASS_REF Attributes	Reference Values
▲ asset		ASSET_CLASS_SAID	Building
intity Classes		ASSET CLASS PARNT SAID ASSET CLASS NM	Building/Utility Class 3
▲ core		ASSET_CLASS_DESC_TX	Class 4
Table Physical Name			Equipment Facility
ASSET ASSET CLASS REF			Land Material Handling Equipment
ASSET PERSON OBJECT N	IILESTONE		Minor Property
CATEGORY_CODE_REF			Non-Navy Property Non-Tangible Assets
COLOR TYPE REF			Structure
CONSTANT_FACTOR	DEE		Transportation Transportation Services
CONTROL_NUMBER_TYPE_ DATA LINK TYPE BEF	HEF	Data Type Character Length	40 Utility
DATA_LINK_TYPE_REF DOD_BASIC_CATEGORY_CO	DE_REF	Key Type	Vehicle
DOD_CATEGORY_GROUP_F DOD_FAC_CODE_MEASURE	REF REF	Links to	Weight Handling Equipment
DOD FAC ANALYSIS CAT (
EVENT_TYPE_REF FEATURE_TYPE_REF		Definition	ASSET_CLASS_SAID
INVESTMENT CATEGORY I	REF	A short name describing the class	
MANUFACTURER_REF NOTE_TYPE_REF			ASSET CLASS PARNT SAID
OBJECT COST			ASSET_CDASS_FARINT_SAID
OBJECT_FEATURE			
OBJECT_FUNCTION OBJECT_FUNDING			ASSET_CLASS_NM
OBJECT_GRAPHIC_DATA_LI	NK	▼ Relates to	
Entity Set	Entity Class		ASSET_CLASS_DESC_TX
Asset	Core		ASSET_CDASS_DESC_TA
Gub-Class Base	Family Reference	<u> </u>	
Table Code		<u> </u>	
Definition	amcorbasrefacr		
This table contains refere	nce (domain) information	I	
	s and those sub-classes in		
which they can be divided	. Also within the table are		
groupings of assets that			
classes but ones that are	of practical use		
		x '	

Component 2 (FY04) – Develop Software Tools:

B. FMSFIE Implementation Tools –

- Investigate Technologies for Future Development
 - Web Based (e.g., XML Web Based technology)
 - Computer Desktop (e.g., Visual Basic, similar to SDSFIE tools (SQL Generator & Access Builder)
 - Schedule dependent upon availability of FY04 Funds.
 - Develop Prototype Implementation Tool –
 - Web Based or Computer Desktop
 - Schedule dependent upon availability of FY04 Funds.
 - Perform QA/QC Testing of Software Tools –
 - Test Software Tools for Defects
 - Test Operation with Windows 2000 & XP Operating Systems



Component 4 (FY04) – Develop FMSFIE Data Models:

- A. Asset Management -
- Facility Class, Building Subclass Focus
 - FY03 Architectural & Facility Baseline Models Completed (Release 2.30)
 - October 2003 Structural & Interior Design Baseline Models Completed
 - January 2004 Mechanical, Electrical, & Plumbing Baseline Models Completed
 - October 2004 Security & Telecommunications Baseline Models Schedule dependent upon availability of FY04 funds.



Component 4 (FY04) – Develop FMSFIE Data Models:

- A. Asset Management (Continued) -
- Facility Class, Utilities Subclass Focus
 - October 2004 Water, Wastewater, Electrical, Fuel, & Heating Baseline Models Schedule dependent upon availability of FY04 funds.





Component 4 (FY04) – Develop FMSFIE Data Models:

B. Environmental Management -

- Environmental Compliance Class Focus
 - October 2003 Environmental Checklist (NEPA Compliance Decision Tree) Baseline Model Completed
 - December 2003 Environmental Compliance Baseline Model Completed
- Environmental Sampling Focus
 - January 2004 Environmental Sampling Baseline Model Completed





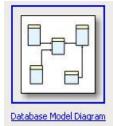
Component 4 (FY04) – Develop FMSFIE Data Models:

C. Migrate IDEF Data Models to UML -

- UML Unified Modeling Language
 - Object Oriented Data Modeling Language



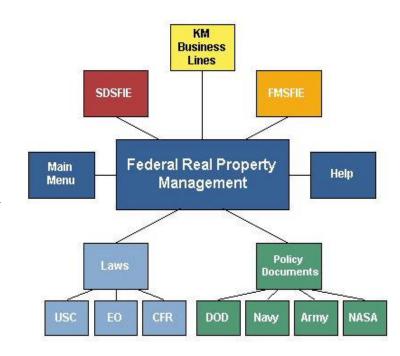
- Has replaced IDEF in use and popularity
- Priority for Migration
 - October 2004 Asset Management, Buildings Architectural & Facility Baseline Models
 - October 2004 Environmental Management, Sampling Baseline Model -
 - Asset Management, Buildings Structural & Interior Design Baseline Models
 - Asset Management, Buildings Mechanical, Electrical, & Plumbing Baseline Models



Component 5 – Real Property Management (RPM):

Scope:

- Web Site to contain U.S. Codes and Executive Orders governing acquisition, maintenance, and disposal of Real Property holdings.
- Provide Traceability Matrix listing of Federal Legal Reporting Requirements Supported by FMSFIE and SDSFIE. Coverage expanded each Fiscal Year.
- Provide web-based FMSFIE Data Dictionary (Sets, Classes, Subclasses, Families, & Tables) with active link to FMSFIE Library (Microsoft Access Database).



• Web Site URL – http://rpm.wes.army.mil/

Component 5 (FY04) – Maintain RPM Website:

- RPM Website Federal Real Property Management Website –
- FY04 RPM Website Contract Support is Currently Awaiting Availability of FY04 Funds. Previous Contract has Expired.
- Projected FY04 Website Maintenance Priorities –
- Maintain Compatibility with Microsoft Operating Systems & Internet Browsers
- Incorporate Customer Comments
- Incorporate New Federal Regulations & Policies
- Expand RPM Regulations to all FMSFIE Classes, Subclasses, Families, & Tables (Traceability Matrix completed in FY03 for FMSFIE Sets).
- Provide Web-Based FMSFIE Data Dictionary (i.e., Sets, Classes, Subclasses, Families, Tables, & definitions) with active link to current FMSFIE Library (Microsoft Access Database).

Federal Real Property Management Website: FMSFIE

FMSFIE Entity Set				
Entity Set	Entity Set Description			
asset_management	Items comprising an inventory of Federal real property and other related entities based on classification and need to support organizational requirements. Includes: (1) tangible physical items comprising the inventory of Federal real property that can be referenced by location; (2) non-tangible items that cannot always be defined by a location, or do not exist as an inventory item in the real property management inventory.	Description of the second		
Defines the stewardship responsibilities as they relate to the environmental management practices.		Class Link		
Planning, programming, and execution of appropriations associated with real property management.		Class Link		
information_security_management	Controlled access to data and information as it is related to the roles of personnel.	Class Link		
organization_management	A structured grouping of personnel and the roles they perform as it relates to an integrated work environment.			
public_safety_management	Issues related to the protection of personnel and property.	Class Link		
work_management	Change management that consists of planning, programming, acquisition, operations, maintenance, revitalization, evaluation, and disposal actions affecting real property and other related entities.	Class Link		

Federal Real Property Management Website: FMSFIE

	Laws Related To FMSFIE	Entity: Ass	sets						
United States Code									
Law Number	Title		Full Text	Traceability Matrix	Status				
10 USC 285 B1	ildings under control of Administrator of General Services		Full Text	Related Information	Active				
	Executive Ord	er							
Law Number	Title	Full Text	Tr	aceability Matrix	Status				
EO 12512	Federal Real Property Management	Full Text	Related :	Related Information					
EO 12803	Infrastructure Privatization	Full Text	Related Information		Active				
	Department of De	fense							
Document Numbe	r Title		Fu	ll Text Traceability M	ıtrix Statı				
OODI 4165.3	Uniform Facility Classes and Construction Categories		Ful	ll Text Related Informati	on Activ				
OODI 4165.67	Revitalizing Base Closure Communities - Base Closure (Community As	sistance <mark>Fu</mark> l	ll Text Related Informati	on Activ				
DODM 4145.19-R	Storage and Warehousing Facilities and Services		Ful	ll Text Related Informati	on Activ				
	Navy								
Document Numb	per Title		Full Text	Traceability Matri					
Document I ditt					x Status				
	Instructions for Preparation and Submission of the T	уре	Full Text	Related Information	X Status Active				
OPNAV 11010.34		уре	Full Text	Related Information					

Federal Real Property Management Website: SDSFIE

Spatial Data Standards for Facilities Infrastructure and Environment

Entity Set	Description	
auditory	The generation and detection of sounds or noise in the environment.	Class List
boundary	The borders or boundaries that define logical or political divisions or subdivisions.	
buildings	The structures located on the face of the earth that were created, by man, to protect man and his possessions from the environment; or to enhance man's activities.	
cadastre	The man-made division of land into areas of ownership and control.	Class List
climate	The movement and effects associated with the earth's atmosphere.	Class List
common	The information that describes the overall data set or components of data that are common to all entity sets.	
communications	The means available to relay data and translate data.	Class List
cultural	The activities of man that are historically significant.	Class List
demographics	The information pertaining to man's trends or traits.	
ecology	The information pertaining to the interrelationship between organisms and their environments.	
environmental hazards	The identification and management of natural and manmade substances, materials, and conditions which are, or have the potential to be, detrimental to life and ecosystems on the earth.	
fauna	The study of the animals in a region or environment.	Class List
flora	The study of the plant life in a region or environment.	Class List
future projects	The information that describes planned projects for future development.	Class List
geodetic	The information pertaining to the size and shape of the earth.	Class List
geology	The geologic features and processes occurring in a given region on the earth.	Class List

Site Document Information

External Document Links:

Federal Real Property Management (RPM):

Fiscal Year 2003 Content Status:

- Currently contains over 1,173 Federal Laws & Policy Documents
- Contains Traceability Matrix of Federal Legal Reporting Requirements supported by:
 - All SDSFIE Entity Sets (total of 26).
 - All SDSFIE Entity Classes (total of 169).
 - All FMSFIE Entity Sets (total of 7).
 - 33 FMSFIE Entity Classes.

Total Number of Laws and Policy Documents: 1173 Laws: 757 United States Codes: 265 Executive Order: 93 Code of Federal Regulations: 373 Other Laws: 25 Policy Documents: 366 Department of Defense: 73 Navy: 192 Navy Claimancy: 125 50 Army: NASA: 32 Air Force: Other Policy Documents:

1144

QUESTIONS?

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